

# ASCCA INTERCHANGE

AMERICAN SOCIETY OF CRITICAL CARE ANESTHESIOLOGISTS

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## President's Message

### A Great Year Behind Us, a Great Year Ahead



Todd Dorman, M.D., F.C.C.M.  
ASCCA President

Wow! The first year of my two-year term has just flown by. I remain humbled and honored to serve with such a dedicated group of professionals. The Executive Board and the Board of Directors have been an enormous help over this year, and their dedication and talent speak well about the future of this Society. The committee chairs have been energetic and have also contributed significantly. And, of course, the work of this Society could not get done without the help of our Executive Secretariat, Chris Dionne.

Our 2009 Annual Meeting just concluded and was an enjoyable meeting filled with a wonderful mix of basic and clinical science. **Andrew Rosenberg, M.D.**, and **Laureen Hill, M.D.**, did a great job in putting together this program of science and education. If you missed this year's Annual Meeting, then you missed state-of-the-art presentations on acute liver failure (**Ali Al-Khafaji, M.D.**), acute lung injury (**Daniel Talmor, M.D.**), pulse pressure variation (**Azriel Perel, M.D.**), statins (**Mark Nunnally, M.D.**) and stroke management (**Michael Ault, M.D.**). The meeting

also included a spectacular presentation during lunch by **Alan Kaye M.D.**, on reflections during the 2005 storm in New Orleans (Hurricane Katrina). Just imagine starting a new job, hiring numerous faculty and then having to potentially fire all of them in the same week! Given the highly regulated environment we reside in, the presentation on the Joint Commission, CMS and IHI (**Brenda Fahy, M.D.**) was quite timely. Finally, the most influential articles of 2009 were presented by three fellows/junior faculty, and the pro-con debate was once again loved by attendees for both its content, high spiritedness and for the use of the audience response system.

The Young Investigator Award was given to **Frederic T. Billings, M.D.**, for his work at Vanderbilt University titled "Early Postoperative Statin Therapy Is Associated with a Lower Incidence of Acute Kidney Injury Following Cardiac Surgery." This year's Lifetime Achievement Award was given to **Robert Sladen, M.B., Ch.B.**, who earned this award through years of high-quality critical care services to patients, years of serving as a mentor to numerous intensivist trainees and faculty, and years of volunteer service to the critical care community by serving on and for numerous national organizations related to critical care, including serving as ASCCA President in 2000-01.

Attendance at the meeting was the largest ever (250), and the immediate feedback was that the meeting was a total success. Next year, the 23rd Annual Meeting will be held on Friday, October 15, 2010, in San Diego. Co-chairs for the meeting will again be **Andrew L. Rosenberg, M.D.**, and **Laureen Hill, M.D.**, as we now have established a transition approach to planning that will ensure continuity and quality while helping develop future leadership. After this next year, Andrew will become an advisor to the planning chairs and Laureen will become

the next chair of the program and an additional individual will be asked to serve as co-chair for a two-year period. The 2010 meeting is already being planned and will grow on the successes of the recent few years. Mark your calendar now for what promises to be another great ASCCA Annual Meeting!

On Saturday, the Fellowship Directors Breakfast was held and chaired by **Theresa Hartsell, M.D.** The group heard presentations by Dr. Cohen on the ACGME and RRC and **Douglas B. Coursin, M.D.**, on the American Board of Anesthesiology. The final topic was a discussion of innovative training programs with updates on the programs at Oregon and UCSF.

On Monday, the ASCCA Breakfast Panel session on Genomic Implications for Perioperative Management was also very successful. We are indebted to Drs. Fahy, Frenzl and Shaw for their hard work in preparing this cutting-edge session.

This year's mentor program was once again orchestrated by **Michael Avidan, M.D.** Michael outdid himself and put on a wonderful program for the eager medical students, residents and fellows who were able to attend.

At the annual business meeting, I presented an update on a few of the major events of this past year. And after **Heidi Kummer, M.D.**, presented the edits to the bylaws, the Society passed the new bylaws with no additional edits or changes. Then the attendees learned that Heidi was resigning from her position on the executive board given some family changes that will cause her next few years to be a tad unsettled. The Society awarded her a plaque for her many years of dedicated service to the Society. Subsequently, the election of new officers was concluded. Please join me in

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### Membership

Membership in ASCCA is open to all anesthesiologists and residents in approved anesthesiology programs. Membership applications may be obtained by contacting ASCCA at (847) 825-5586 or through the ASCCA Web site at [www.ascca.org/shop/index.php](http://www.ascca.org/shop/index.php).

### ASCCA Dues

Dues are \$150 for active members; \$100 for affiliate members and \$20 for residents/fellows. Dues may be paid online at [www.ascca.org/shop/index.php](http://www.ascca.org/shop/index.php) by credit card or by mailing payment to the ASCCA office at 520 N. Northwest Highway, Park Ridge, IL 60068.

Remember, payment of your dues allows you to enjoy the full privileges of ASCCA membership.

## EDITORIAL NOTES

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The opinions presented are those of the authors only, not of ASCCA. Drug dosages, accuracy and completeness of content are not guaranteed by ASCCA.

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### A Note from the Editor to ASCCA Members:

If you would like to contribute a review for a Fellowship Program at your institution in a future issue of the ASCCA Interchange, please contact Chris Dionne at [c.dionne@asahq.org](mailto:c.dionne@asahq.org).

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## ASCCA 2009 Annual Meeting Review



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Laureen L. Hill, M.D.  
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The ASCCA 2009 Annual Meeting was held in New Orleans on Friday, October 16, 2009, with a record attendance of 252 registrants, including 40 fellows, 19 FAER Scholars and 23 anesthesia residents. Following a continental breakfast, **Andrew Rosenberg, M.D.** (University of Michigan) opened the session and welcomed **James Blum, M.D.** (University of Michigan) as moderator of the Clinical and Basic Science Topics 1 session. **Ali Al-Khafaji, M.D., M.P.H.** (University of Pittsburgh) started the session by speaking about acute liver failure and reviewing pathophysiology, biochemical disturbances and management principles. **Azriel Perel, M.D.** (President, Israel Society of Anesthesiologists) then presented a body of work related to the physiologic basis and clinical applications of pulse pressure and stroke volume variation in mechanically ventilated patients. The session concluded with **Daniel S. Talmor, M.D.** (Beth Israel, Boston) who provided a comprehensive update on acute lung injury.

The 2009 Lifetime Achievement Award was presented to **Robert N. Sladen, M.B., Ch.B., F.C.C.M.** (Columbia Univ.) by **Gerald A. Maccioli, M.D.** (ASCCA Past President). Dr. Sladen's many outstanding contributions to critical care medicine were cited, including his numerous publications and invited lectures, his record of service and leadership in the ASCCA, including as its president, as well as his ongoing legacy of resident and fellow trainees as vital members and contributors to the critical care medicine community.

A record 48 abstracts were submitted, of which a total of 37 posters were for presentation at this year's meeting. **Douglas B. Coursin, M.D.** (University of Wisconsin), **Ronald Pearl, M.D., Ph.D.** (Stanford), **Jeanine Wiener-Kronish, M.D.** (Massachusetts General Hospital) and **William E. Hurford, M.D.** (University of Cincinnati) moderated the poster sessions held during both the morning and afternoon programs. The Young Investigator Award was presented by **Michael Avidan, M.D.** (Washington University) to **Frederic T. Billings IV, M.D.** (Vanderbilt) for his study titled "Early Postoperative Statin Therapy Is Associated With a Lower Incidence of Acute Kidney Injury Following Cardiac Surgery." In this study of 324 patients undergoing elective cardiac surgery, early postoperative statin use reduced the odds of acute kidney injury by 68 percent. This association was consistent between preoperative statin users and non-users. Two additional posters were awarded Honorable Mention: "Expression of Fetal and Adult Acetylcholine Receptor Isoforms Following Acute Denervation," submitted by **Christopher Kramer, M.D.**, et al., from the Klinik für Anaesthesiologie (Munich), and "Anti-Apoptotic Effects of Nitrite on Liver Ischemia Reperfusion Injury," submitted by **John D. Lang M.D.**, and colleagues at the University of Washington.

The Fellow's Forum was a new session offered at this year's meeting where three current and recent critical care fellows each presented an article and participated in a panel discussion moderated by **Laureen Hill, M.D.** (Washington University) on a variety of critical care topics. **Samuel Galvagno, M.D.** (Johns Hopkins) presented a paper on the effect of evidence-based feeding guidelines in which a multi-faceted practice change strategy was introduced in intervention ICUs and successfully promoted earlier feeding and greater nutritional adequacy without any demonstrable improvement in clinical outcomes. **Sarah Cocoma, M.D.** (University of Chicago) presented an article on the impact of ACGME mandates on current teaching and evaluation methods in critical care medicine in

which survey respondents reported adverse effects on education and patient care in the ICU and described increased faculty clinical workload and inadequate protected time as barriers to changes in critical care graduate medical education. Lastly, **Breandan Sullivan, M.D.** (Washington University) discussed a study comparing dexmedetomidine and midazolam sedation in mechanically ventilated patients in which dexmedetomidine sedation was associated with fewer ventilator days and decreased incidence of delirium but no difference in survival.

During lunch, participants heard from **Alan Kaye, M.D.**, about his experiences at LSU during Hurricane Katrina and its aftermath with a slide show and lecture titled: "A personal journey during Katrina: Reflections of an anesthesiologist during the storm of the century."

**Theresa Hartsell, M.D., Ph.D.** (Johns Hopkins) moderated the Clinical and Basic Science Topics 2 session, which started with a presentation by **Mark Nunnally, M.D.** (University of Chicago) about the use of statins in the ICU and the potential beneficial pleiotropic effects on inflammation, coagulation and vascular reactivity. This was followed by a lecture from **Michael Ault, M.D.** (Northwestern University) on modern stroke management and the use of pharmacologic and non-pharmacologic strategies to support the ischemic penumbra. The final topic, an update on the regulatory horizon, was presented by **Brenda Fahy, M.D., F.C.C.M.** (University of Kentucky) and included discussion of CMS' proposed elimination of hospital inpatient consultation codes, P4P billing codes, "never events," SCIP measures and ICU measure sets for organization-specific public reporting.

The afternoon session concluded with a lively interactive pro-con session moderated by **Andrew Rosenberg, M.D.**, during which the case of a 55-year-old female s/p colectomy with sepsis, bleeding and acute kidney injury was discussed. Panelists **Andrew Gettinger, M.D.**

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## Delegate's Report



Mark E. Nunnally, M.D.

The ASA House of Delegates met on Sunday and Wednesday of the ASA Annual Meeting last October 2009. Members discussed and debated numerous topics. The current debates over health care reform colored some of the deliberations, as did the way the Society conducts business.

The House of Delegates is the main governing body of the ASA, but meets only once a year during the Annual Meeting. The rest of the year, the Administrative Council or the Board of Directors manages business. Ultimately, some aspect of all the year's business is discussed, debated and put to decision by the House of Delegates. As a large organization, the specifics of decision-making power coupled with the fiduciary responsibility of the Society's leaders makes for interesting debate.

A major theme this year was the expansion and emphasis of our subspecialty's mission in clinical care and education. Topics of interest to the Society include:

**Anesthesia Quality Institute:** This program is early in its development. The Institute has a director, **Richard P. Dutton, M.D., M.B.A.**, and is beginning the long process of acquiring data. This project could benefit the ASA and the critical care community in many ways. The opportunity to create new metrics and measure performance is a terrific if not daunting opportunity. Databases could be a way to share information and inform practice. More important in the short term, quality measures are a crucial component of negotiation with regulators and reimbursement bodies.

All of these potential benefits will be compared with the realities of defining quality metrics and obtaining reliable data. In order for the data to be useful, it has to be measured, graded and attributed to some sort of acceptable outcome. Some things are simply too hard to measure. Others might be easier, but do not describe the subtleties of clinical care. For regulators and reimbursing institutions, process metrics have appeal, but only with a clear relation to outcomes. The institute's development will be a learning experience for all involved.

**Fellowship Applications:** Through efforts of the Resident Component, there is a plan to standardize fellowship applications in anesthesiology. This will undoubtedly restrict some of the current system's flexibility, but should improve the timely availability and exchange of information. It will also impose a unified and coordinated schedule for applications and interviews.

**Geriatric Anesthesia:** The Committee on Geriatric Anesthesia has proposed putting a member of the Committee on Critical Care on that committee as an adjunct member to help address the issues relating to an aging patient population. The critical care community has extensive experience with elderly patients.

**Anesthesia Continuing Education (ACE) Program Editorial Board:** Feedback from subscribers indicates an interest in subspecialty add-ons to existing programs, including critical care. As our specialty's profile in continuing education continues to grow, this is another excellent opportunity to expand our educational mission. Expansion to subspecialty add-ons will be a large undertaking for the ACE program. This may be a great opportunity for the talent in ASCCA.

Three races were contested this year, building on a growing trend of competition for ASA political office. Although the ASCCA's immediate past president, **Gerald Maccioli, M.D.**, lost a spirited race to **Linda Mason, M.D.**, for Assistant Secretary, we have reason to be proud that his accomplishments position him to be an important part of the ASA political landscape. ASCCA member **Charles Otto, M.D.**, will be leaving the ASA Administrative Council, having been defeated by **Jerry Cohen, M.D.**, in the election for First Vice President. We congratulate Dr. Mason and **Arnold Berry, M.D., M.P.H.**, on their victories and look forward to continuing contributions from Drs. Maccioli and Otto, both of whom have been important parts of the ASA's ongoing success. We are fortunate to have such excellent leadership coming from the specialty of critical care!

## PRO: Federal Government Involvement in End-of-Life Care Will Add Quality and Cost-Effectiveness.



Francis X. Dillon, M.D.  
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The primary problem of end-of-life care is that tremendous resources are devoted to care in the last weeks of life, often contributing to nothing but a painful prolongation of the patient's death at a cost of many tens of thousands of dollars per patient.

Guidelines related to care in futile medical situations could relieve the caretakers of the burden of either encouraging or discouraging patients' families to support or oppose aggressive measures. Additionally, these guidelines might provide a measure of authority and defense to physicians who often feel driven to practice defensive medicine at times when patients become critically and perhaps irreversibly ill. Defensive medicine in such settings may mean ordering not only an additional test or two, but ordering a library of tests and procedures such as dialysis that cost thousands per day and may merely prolong life for the short term, at an astronomical cost.

Could such guidelines be implemented with success in the United States? There are two

examples of English-speaking nations whose populations have been satisfactorily served by nationalized health care systems for generations. The United Kingdom's National Health Service is highly popular and has been in existence (since July 5, 1948) long enough to have a number of practical issues resolved. The Web presence of the NHS quickly shows the comprehensive range of services available and is easily navigated.<sup>1</sup>

So, unlike the American H.R. 3200, the socialized medicine practiced in the United Kingdom is not mere theory, it is a functioning health care delivery system. In fact, it has evolved to deal with end of life care. The hospice and end-of-life functions of the NHS have been strengthened by an initiative called the Gold Standards Framework (GSF). A recent article in the Manchester (U.K.) *Guardian* summarizes the views of the head of GSF, Keri Thomas, M.B.B.S., M.Sc., a physician specialist in palliative care.<sup>2</sup>

Among her aims is to make it possible for a greater number of patients to die at home, with input from palliative care teams. Often a moribund patient will be brought to the hospital where end-of-life care is usually futile and expensive. Thomas asserts that planning with families about the end of life would decrease the incidence of short-sighted and often inappropriate admissions.

It is difficult for individual physicians, in our current health care setting, to have such comprehensive access, authority, cooperation and the ability to frame-shift perspective from preserving life to institution of comfort measures-only care. It happens regularly in the context of caring for patients in the ICU, but usually after any number of heroic (and expensive) measures have been attempted and no rational plan for accepting the end of life has been entertained or presented to the patient and family.

Is it unreasonable for a cadre of specialists such as the GSF teams above to approach the issue of end-of-life care before the expensive last few weeks have begun? Is this a function

that the private sector can address, or is the proof that it cannot and the proof that government intervention is needed already present in abundance? If we in a free system predictably overspend dramatically in the last days of life, producing no useful addition to life, does this not establish soundly that oversight in the form of a comprehensive government health insurance policy would improve quality and decrease cost?

Without a detailed statistical expose here, one can still assert that per capita spending on care in the United States greatly exceeds that in the UK (\$6,719 to \$2,815), according to the World Health Organization.<sup>3</sup> But the comparison is unsound, because 100 percent of the citizens of the U.K. are covered by the NHS, and Centers for Medicare & Medicaid Services (CMS) coverage only extends to 28 percent of Americans. Comparing CMS to NHS coverage is more relevant: Per capita spending for Medicare and Medicare patients is still greater, \$5,694. Cost containment in Medicare is aggressive from a provider's standpoint, as CMS pays physicians pennies on the dollar. Still not much savings is evident, and this is a strong argument against socialized medicine to its opponents.

The key fact is: The cost spent on the average Medicare or Medicaid recipient *in the last year of life is \$22,107, almost four times greater than the average quoted above.* Certainly, significant savings would result from any health reform that would deal with end-of-life care with more realism and practicality, and the U.K. model appears to be doing this with some degree of success.

### References:

1. Accessed October 12, 2009, <http://www.endoflifecare-foradults.nhs.uk/eolc/index.htm>
2. Accessed October 12, 2009, <http://www.guardian.co.uk/society/2009/jan/28/keri-thomas-nhs-end-of-life-care>
3. Accessed October 12, 2009, <http://www.who.int/whosis/whostat/2009/en/index.html>

## CON: Federal Government Involvement in End-of-Life Care Will Reduce Quality and Cost-Effectiveness

Francis X. Dillon, M.D.

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There is no time more stressful for family members and caretakers than end-of-life meetings and discussions. Each is singular; there is no way a certain situation can be categorized, organized or generalized. Likewise, any purported guidelines are bound to provide no counsel of value; they will be seen as inappropriate intrusions at best, more likely as the worst kind of tyranny. Trying to circumvent these rules or decisions will bring severe penalties, clearly not to grieving families, but to the caretakers.

To opine rationally about this topic requires that one read the proposed H.R. 3200, which is over 1,000 pages long.<sup>1</sup> It is the clearest indication of what government-sponsored end-

of-life care would entail. Peter Fleckenstein, an industrious blogger, has gleaned all of the bill's provisions and has posted them, in plain English, on his Web site.<sup>2</sup> The provisions dealing with end-of-life care begin on or about page 430. They state that officers of the new health care system will have the authority to prescribe courses of treatment, be they aggressive, comfort measures only, or anything in between, when end-of-life care is considered. Patients and physicians' wishes are taken into account but by no means is either party able to prescribe or obtain care unless approved by the new health administration.

"The rest of H.R. 3200 has provisions that force citizens to buy health insurance, that set physician salaries which 'shall apply without regard to the specialty of the physician furnishing the service (page 22). It also sets fees for the insurance premiums, and for everything else (page 126). It regulates all the allied health professions as well, including nurses and nurse

assistants. It creates agencies which search for what it considers bad performance (having a patient readmitted after discharge from the hospital carries stiff penalties, page 268). Abuse, waste and fraud are anticipated by health care workers, and therefore sub-agencies that are devoted to fighting them are funded. H.R. 3200 micro-manages every conceivable aspect of health care (page 268, for example, regulates power-driven wheelchair sales and purchases) and preventive health, as defined in the broadest possible terms by the government."

There appear to be no limits to how far this legislation might reach into patients' personal lives. In other words, patients would have no "right" anymore to care or be cared for according to their own wishes, with privacy and anonymity, and according to their own private financial arrangements with their chosen physicians. Instead, they would be dictated to much as if they were in military service, or prison.

But the comparison is inappropriate: Prisoners and military personnel may not have their lives taken from them without trials (i.e., due process). H.R. 3200 has no provisions for trials or hearings. What it does provide is found in the infamous Subtitle D, Sec. 132 (page 37). To wit: "*IN GENERAL.—A QHBP [the acronym means a government health benefits policy] offering entity shall provide for timely grievance and appeals mechanisms that the Commissioner shall establish.*" The Health Choices Commissioner is an executive office which would be created by H.R. 3200. He/she would be appointed by the President with advice and consent of the Senate. He/she would be the "health czar" and rule the health administration. Thereafter would be neither privacy nor physician – nor patient – autonomy. Instead, a huge bureaucracy would grow and dictate millions of rules and guidelines.



*Continued on page 19*

## Fellowship Program Directors' Breakfast



Theresa Hartsell, M.D., Ph.D.  
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Thirty-four program directors and their designees filled the Rosedown Room early Saturday morning for the 12<sup>th</sup> Annual Fellowship Program Directors Breakfast Symposium. Discussion this year focused on Residency Review Committee insights specific to critical care medicine training and on a much-awaited update to American Board of Anesthesiology (ABA) relations with other subspecialty societies.

### State of specialty training programs

Neal Cohen, M.D., M.P.H. (UCSF), Vice Chair of the ACGME Residency Review Committee for Anesthesiology, described the current state of anesthesia critical care fellowship training programs. There are currently 45 accredited fellowships, a decrease from 47 last year and from greater than 50 in previous years. In 2009, there are 62 anesthesia critical care fellows, also a decrease from 69 fellows in 2008; 38 percent of these are female and 63 percent are graduates of U.S. training programs. He indicated that many programs are struggling and many have had no fellows for an extended time, which clearly has impact on resident education and recruitment to the field. In comparison,

there are 32 medicine critical care programs with a total of 136 fellows (87 first year), 152 pulmonary critical care medicine programs (1,266 fellows in total), 94 surgical critical care programs (152 fellows) and 25 neuro-critical care programs. For pediatrics, there are 61 pediatric critical care programs (357 fellows), and we are seeing an increase in interest for training from individuals trained in obstetrics.

### ABA Update

Continued discussions between the ABA and American Board of Surgery have finally come to fruition with a tentative agreement to move ahead in the next 18 months to a common certification exam. Douglas B. Coursin, M.D. (University of Wisconsin) indicated that this is driven by economies of scale, given the expense of administering the exam to two relatively small groups of fellows yearly, and by the similarity of the content outlines. Individuals who cross-train in fellowships of the other specialty are already able to have their training recognized by the respective boards. The present letter of agreement forms a joint oversight committee with four members from each board; the chair will alternate between specialties on an every-two-year basis. Certification will continue to be granted by the individual board, and the agreement is crafted so that the ABA will lose neither autonomy nor intellectual property as a result. Work now will focus on creating a common content outline, a common question format and a common exam period.

On the other hand, after several years of discussion, the American Board of Emergency Medicine and American Board of Internal Medicine (ABIM) have joined together to offer a five-

year combined program through which EM-trained individuals can complete three years of primary emergency medicine followed by two years of medicine critical care leading to board certification in critical care through the ABIM. To this point, many emergency medicine physicians trained in anesthesia programs but without a route to certification save finishing a second fellowship year and passing the European critical care boards.

### New Trends From the RRC

Of note this year, program directors will notice that their fellowships are being independently accredited apart from the core program in anesthesiology. This should serve to help fellowships where the core program may be experiencing difficulty, and vice versa. As a result, RRC site visits are no longer coordinated between programs, and the cycle lengths of a core program and associated fellowships may be dysynchronous. Increased emphasis will be placed on the institutional internal review held at the appropriate mid-point of the cycle.

For the site visit, it is important to remember that the educational curriculum for anesthesia critical care fellowships is defined by the

ABA-approved content outline. Dr. Cohen pointed out that the ACGME does not know critical care medicine, and in fact most of the site visitors and RRC staff are professional educators (or at most, clinicians from another specialty.) As a result, if we as a group believe that content areas of the curriculum should be changed, emphasized or de-emphasized, we need to change the outline outright. The way in which a fellowship provides instruction in the areas of the content outline is left up to the individual

“Continued discussions between the ABA and American Board of Surgery have finally come to fruition with a tentative agreement to move ahead in the next 18 months to a common certification exam”

program, but the site visitor will be particularly alert for rotations or curricular experiences that exist only on paper.

The resident survey has taken on increased importance in providing the RRC a view of your program, and areas of non-compliance will be addressed during the site visit. In particular, you must have a mechanism for fellows to provide confidential feedback about faculty and about the program. Obviously, this can be difficult for programs with a small number of fellows; some possibilities discussed to overcome this issue include burying fellow responses with parallel resident evaluations with the evaluations of other critical care fellows, or by having another program director designated to receive such input.

Regarding work hours, the Institute of Medicine (IOM) duty hours report has now been sent to the ACGME for implementation (with the understanding that if this is not accomplished, CMS will move impose these restrictions.) Expect to see a report within six to eight months delineating the ACGME's approach, which we expect will incorporate most, although not all, of the IOM recommendations.

Keep your eyes open for the ACGME's new periodical, the *Journal of Graduate Medical Education*. Program directors should have received a print copy of the September 2009 inaugural issue. This journal will be a forum for peer-reviewed manuscripts on graduate medical education topics of interest to a broad audience as well as a non-peer-reviewed section of ACGME/RRC news and views on topics of interest to program directors and educators alike.

### Innovative Programs

Much emphasis has been placed on the development of "innovative programs" – rethinking how one trains in a particular area. The RRC is very open to proposals for such programs; one key to successful application is to consider carefully in advance how one might assess the success of the proposed training pathway. Of note, positions granted to an innovative program

are separate and distinct from the existing residency or fellowship. For example, if a program combines anesthesia residency and critical care fellowship and a trainee decides to drop out of the innovative program continuum, he or she cannot simply become a resident in the traditional program. The RRC is presently constructing review templates for such programs; the process for applying for accreditation is currently via letter of proposal and is delineated on the ACGME Web site at [www.acgme.org](http://www.acgme.org).

Currently, there are several programs integrating primary training in anesthesiology with advanced critical care training. The program at Oregon Health and Science University (OHSU), which was described in detail at a previous breakfast symposium presently has eight trainees enrolled. Matthias Merkel, M.D., indicated that resident interest in the program continues to be brisk with an applicant-to-position ratio as high as 100:1. Over the years since the program's inception, one resident-fellow has changed from the residency-critical care to the residency-research track, but no residents have desired to leave the four-year continuum. The critical care residents have appreciated their "VIP" status within the critical care units and not needing to go through the fellowship decision and application process. The only downside noted has been that residents in the final "integrated" years are searching for ways to benchmark their progress against their peers.

The University of Washington (Steven Deem, M.D.) and The University of California, San Francisco (Linda Liu, M.D.) each have new integrated programs. UCSF has two positions for an integrated five-year Critical Care Scholars track that includes clinical anesthesia (including clinical base year) and critical care fellowship as well as integrated research training. In this program, three clinical fellow months are moved forward into the CA-3 year to create room for additional research time and electives. Columbia University (Robert Sladen, M.B., Ch.B., F.C.C.M.) offers the prestigious two-year

Apgar scholarship, which allows interested individuals two additional years of support and academic training; several have applied to critical care medicine.

The RRC has seen proposals for integrated programs in critical care medicine and cardiothoracic anesthesia, although none has yet been approved. Although there is no set timeline for what an innovative program in these disciplines would be, a recent proposal for a shortened 18-month program (nine months of critical care, nine months of CT anesthesia) was recently denied. Given discussion in the past about the optimal length of critical care training, many present were intrigued by the possibility of a 24-month continuum in critical care and echocardiography.

### AASPD: Association of Anesthesiology Subspecialty Program Directors

The newly formed AASPD will had its first meeting coincident with the SAAA meeting in Boston in November. It will be important to have critical care involvement in this organization from the beginning as our needs as a specialty may be somewhat different than our colleagues in other subspecialties of anesthesia. At this inaugural meeting, the AASPD was asked by the ASA resident component to consider a move to a common program application that would be via the ERAS service. We have debated this issue as a group previously, with concerns that the elements of the ERAS time cycle may be prohibitive to the flexible application period that many fellowships feel is crucial for recruitment. More information will be forthcoming!

## Fellowship Review I: Multidisciplinary Critical Care at Washington University School of Medicine and Barnes-Jewish Hospital



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Associate Program Director, Critical Care Fellowship  
Department of Anesthesiology  
Washington University  
St. Louis, Missouri

The Multidisciplinary Critical Care Fellowship at Washington University and Barnes-Jewish Hospital is at the leading edge of a revolution in intensivist training and education. The ACGME-accredited program promises and delivers an exceptional experience remarkably rich in education, research and leadership opportunities in this rapidly expanding field of medicine.

### Home Base : The Surgical Intensive Care Unit

Barnes-Jewish Hospital is a tertiary referral center and level I trauma center with a broad catchment area and an enormous scope of influence. Our patient base arrives from the entire state of Missouri and parts of every bordering state: Iowa, Illinois, Kentucky, Tennessee, Arkansas, Oklahoma, Kansas and Nebraska. The Surgical Intensive Care Unit (SICU) is a closed ICU that comprises 24 beds allocated to an array of critically ill or injured surgical patients requiring pre-operative stabilization, post-operative intensive care after elective or emergency surgery, or

critical care following complications of surgical illnesses. Patients admitted to the SICU arrive from all of the surgical subspecialties, thus providing a broad base of experiences. Our intensivists hail from the disciplines of anesthesiology, surgery, and emergency medicine, and are consistently ranked among the top teaching faculty in the department of anesthesiology.

Our fellows also spend a significant portion of their time in our state-of-the-art Cardiothoracic Intensive Care Unit (CTICU), a 21-bed unit devoted to the perioperative care of a diverse mix of routine and complex cardiac and thoracic surgical patients. Among other strengths, we have world-class lung transplantation, cardiac transplantation, ventricular-assist device, complicated valvular repair and replacement, and aortic repair programs. Other intensive care units that play a significant role in our fellowship include our Medical ICU, Neuro ICU, Coronary Care Unit, and the Pediatric ICU at Saint Louis Children's Hospital.

### The Educational Curriculum: Foundation and Innovation

Our goal is to train our fellows for a future of leadership in critical care, and a sound didactic program underlies that goal. Our weekly Critical Care Lecture Series provides the foundation for a strong base of knowledge. Speakers from many disciplines participate, delivering a distillation of the most current thinking in all facets of critical care. As part of the Lecture Series, each fellow gives two lectures per year on the topics of their choice. At our monthly Journal Club, the faculty and fellows participate in what is invariably a lively discussion about an article in the most current literature. Our monthly Clinical Outcomes and Unit-Based Quality Improvement meetings provide a forum to discuss patient safety and opportunities to improve our delivery of care.

Innovations in the education of our fellows are constantly being explored. Currently, we are collaborating with the nationally recognized

Clinical Simulation Center at the Washington University School of Medicine to develop novel approaches to fellow, resident and medical student education. Additionally, our Web-based critical care curriculum is growing by leaps and bounds every week.

### Research Opportunities: Mentorship on the Cutting Edge

The Department of Anesthesiology at Washington University School of Medicine is a national leader in research. We ranked first among departments of anesthesiology nationwide with over \$7 million in National Institutes of Health funding. The School of Medicine ranked fourth in NIH funding with over \$350 million awarded in 2008. Clinical and basic science investigations occur in all of the subspecialty areas, and many include partnership with experts in other disciplines such as cardiology, hematology or endocrinology. Fellows are offered mentorship in developing their own research projects as well as being encouraged to participate in ongoing research projects. All research seminars and research conferences are open to our fellows, and our monthly Clinical Research Group is a valuable source of project development ideas.

### Putting It All Together

Critical care medicine is a rapidly advancing subspecialty, and the Multidisciplinary Critical Care Fellowship Program at Washington University and Barnes-Jewish Hospital provides innumerable opportunities to help shape the future of the field. We hope that you will come to Saint Louis to visit our exciting program.

For additional information regarding the Multidisciplinary Critical Care Fellowship Program, please feel free to contact the fellowship director, Dr. Walter Boyle [boylew@anest.wustl.edu](mailto:boylew@anest.wustl.edu), the associate fellowship director, Dr. Eliot Fagley [fagleyr@anest.wustl.edu](mailto:fagleyr@anest.wustl.edu), or the program coordinator, Mrs. Barbara McKinney [mckinneyba@anest.wustl.edu](mailto:mckinneyba@anest.wustl.edu). We can also be reached by telephone at (314) 747-3581.

## Fellowship Review II: UC San Francisco Critical Care Fellowship



Lonnie Fender, M.D.  
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San Francisco, California

Welcome to Critical Care Medicine at UCSF! The anesthesia critical care fellowship at the University of California, San Francisco, is a comprehensive, fully ACGME-accredited, 12-month program that well enables its graduates to care for the critically ill patient.

### The Faculty and Fellows:

Attending physicians with subspecialty certification in critical care staff the intensive care units at UCSF. The group is very multidisciplinary and comes from the departments of anesthesia and perioperative care, pulmonary and critical care medicine, surgery, and nephrology. This variety of expertise provides different approaches to patient management and enriches the learning experience of the trainees. The critical care fellows also have an equally diverse background; they have completed residencies in anesthesiology, internal medicine, neurology, emergency medicine or surgery.

### The Rotations:

Most of the clinical experience in the fellowship is provided by eight months of critical care rotations based at the UCSF Moffitt Long Hospital, a state-of-the-art tertiary medical center. UCSF is the referral center for northern and central California and parts of Nevada as well as an international destination for health care. Moffitt Long Hospital is home to two medical/surgical/transplant ICUs, a neurology/neurosurgical ICU, and a cardiology/cardiothoracic ICU. Additionally, San Francisco General Hospital, a regional level 1 trauma center, is home to another 16-bed ICU, where fellows spend one month focusing on the care of patients with blunt or penetrating trauma, traumatic brain injury and burns. Three months of the year are allotted for elective time. The options are endless and can be tailored to each fellow's interests. Common choices have included rotations with: infectious disease, nephrology, cardiology, pulmonology, nutrition, respiratory therapy, echocardiography (both TTE and TEE) and research. Some more adventurous fellows have also arranged electives abroad in Africa.

### The Typical Day:

Every day begins with an hour-long didactic conference on topics pertinent to critical care, followed by more bedside teaching on attending rounds. Early in the academic year, attendings deliver more of the lectures and have more presence during rounds, but as the year progresses, fellows are expected to contribute to the lecture series and lead rounds. In the afternoon, fellows are responsible for the function of the ICU with guidance from the attending. The fellows gain experience by supervising procedures, coordinating patient care, teaching the students and residents, and participating with patient triage decisions. To quote one attending: "It's your unit, I'm just here to help and answer questions."

### The Teaching:

A strong curriculum of didactic sessions and learning opportunities is designed just for the critical care fellow. Fellows begin the year with two weeks of daily evening lectures in order to prepare them to function in the ICU. Throughout the year, fellows participate in training sessions at the UCSF simulator center, attend a fully-funded ATLS certification course, obtain ACLS instructor certification, and participate in a weekly fellow-faculty conference. Fellows also coordinate a monthly morbidity and mortality conference that includes gross and microscopic presentations from the pathology department.

### Why Consider UCSF?:

If you are looking for a critical care anesthesia fellowship with great facilities, a complex and diverse patient population, approachable yet world-renowned faculty, a collegial work environment, comprehensive clinical experience, and strong academic training, you should look no further. I invite you to contact us today by visiting our Web site at [www.ucsf.edu/ccm](http://www.ucsf.edu/ccm) or contacting our program director:

**Linda Liu, M.D.**, Professor of Clinical Anesthesia, Anesthesia Critical Care Fellowship Director, 505 Parnassus Ave, Box 0624 San Francisco, CA 94143, [liul@anesthesia.ucsf.edu](mailto:liul@anesthesia.ucsf.edu) (415) 353-1116

## Fellowship Review III: Critical Care Medicine Fellowship at the University of Florida



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Associate Residency Program Director  
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Department of Anesthesiology

### Fellowship Review:

Critical care medicine (CCM) at the University of Florida is made up of a multi-specialty team of intensivists whose belief that non-balkanized, multi-disciplinary critical care medicine has been, and remains, the optimal critical care delivery model. For this reason, the entire division has worked very hard to maintain the multi-specialty nature of the faculty and (with few exceptions) non-specialty specific units.

At present, CCM manages approximately 68 intensive care beds (a 30-bed multi-specialty Surgical Intensive Care Unit, a 30-bed Neuro Intensive Care Unit (including patients with both neurosurgical and neurologic disease states), and an eight-bed Burn Intensive Care Unit) at Shands Hospital in Gainesville, to provide care for approximately 3,500 of the most acutely ill patients in the Southeastern United States. The various CCM teams (including attendings, fellows, residents, various physician extenders and medical students) admit and care for patients from all surgical specialty services (with the exception of cardio-thoracic surgery) and comprise an important part of the code team.

CCM fellows and residents are fully integrated into teaching and patient care teams as they coordinate daily true multidisciplinary working and teaching rounds (including CCM, pharmacists, dieticians, therapists and many others), daily resident lectures, weekly fellows' conference and monthly morbidity and mortality rounds. Additionally, critical care grand rounds are held bi-weekly, and critical care journal club is held monthly. The Human Patient Simulator laboratory is also utilized for extensive one-on-one fellow and resident education.

The CCM fellowship program (ACGME-approved for up to six fellows annually) is specifically designed to prepare its trainees to direct a busy intensive care unit following completion of the fellowship. This includes not only

the development of all necessary medical and technical skills and knowledge, but also the development of appropriate teaching and administrative skills. CCM fellows become skilled in dealing with all types of individuals who may come through the intensive care unit, such as patients' families, friends, medical and surgical consultants, and many others.

Additionally, CCM fellows develop skills in evaluating research projects and scientific papers as fellows are expected to participate in clinical and laboratory studies as well as quality projects during their fellowship year. Current research interests include, in the broadest terms, respiratory and cardiovascular physiology, disease-state-based outcomes, traumatic brain injury, nutrition, renal physiology and trauma. It is expected that each fellow will be able to successfully complete at least one project with an accompanying presentation and publication.

For additional information, please feel free to contact Dr. A. Joseph Layon, CCM Fellowship Director, by telephone at (352) 265-0486 or by e-mail at [layon@ufl.edu](mailto:layon@ufl.edu).

## ASCCA 2009 Annual Meeting Review

*Continued from page 3*

(Dartmouth), **Michael Gropper, M.D., Ph.D.** (UCSF) and **Andrew Shaw, M.B.** (Duke) offered expert opinion and fielded questions and comments by audience participants.

The ASCCA Mentorship program, under the

leadership of Dr. Avidan (Washington University), enjoyed another successful year with the participation of 63 anesthesiology/critical care trainees who were paired with faculty mentors for the day. The participants met at the conclusion of the educational session before attending the wine and cheese reception held following the ASCCA business meeting.

## Fellowship Review IV: SUNY Downstate Anesthesia Critical Care Medicine Fellowship Program Review



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Fellow, Anesthesia Critical Care  
Assistant Professor of  
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Medical Center  
Brooklyn, New York

### History

The Anesthesia Critical Care Medicine Fellowship Program at SUNY Downstate Medical Center was first approved on September 22, 1994, under the directorship of **Ashraf Boutros, M.D.**, who remained program director until his departure in 1998. After that, **Jean Charchaflieh, M.D., M.P.H., F.C.C.M.**, assumed the directorship of the program and remains in this position. Since its inception, the program has trained 21 fellows who are now practicing anesthesia and critical care in private and academic settings, including institutions that are affiliated with the program, such as SUNY Downstate Medical Center and Kings County Hospital. Many of the graduates of the program had a diverse medical background that benefited their training and careers in critical care anesthesiology.

Currently, the program has two fellows in training, of which one had previous anesthesia and critical care background in his home country, and the other was an emergency medicine attending for 10 years prior to joining the program. This diversity of background enriches the training of the fellows in the program as well as their practice in the multidisciplinary field of critical care medicine.

### Clinical Training

At SUNY Downstate, critical care fellows do most of their intensive care training in a mixed medical-surgical intensive care unit (MSICU) which covers all medical and surgical patients, including those who have undergone neurosurgical or neuro-interventional radiology procedures. In-house attending supervision is provided on a 24/7 basis by board-certified intensivists. Their constant presence enhances the training of the fellows as well as the care of the patients. The diverse backgrounds of the attending intensivists which include anesthesiology, pulmonology and surgery, broaden the perspective of fellows, who are taught diverse evidence-based approaches to the clinical problems they encounter in the ICU.

Fellows also rotate through the cardiothoracic intensive care unit (CTICU), pediatric intensive care unit (PICU) and coronary care unit (CCU). Up to three months of the fellowship can be spent in electives such as basic science research, diagnostic bronchoscopies and echocardiography, including trans-esophageal echocardiography (TEE). Fellows take an active role in the didactic, administrative and research activities of the program. Fellows are progressively given more autonomy in preparation for their future roles as practicing intensivists.

### Didactics, Education and Research

Weekly critical care conferences are conducted to cover the core curriculum in critical care with updated knowledge from the literature. Fellows also participate in weekly colloquia and grand rounds held by the anesthesia department. These include didactic lectures to cover the core curriculum in anesthesiology, case-based discussions and talks by visiting professors. Fellows also participate in weekly didactic activities of the pulmonary critical care medicine fellowship program and multidisciplinary conferences relevant to critical care medicine.

The program is enriched by the presence of excellent research faculty, including the directors of departmental neuroscience and immunology laboratories. Previous work conducted by critical care fellows in these labs have focused on brain protection and the immunologic basis of sepsis. Previous research activities of critical care fellows from SUNY Downstate Medical Center have been presented in many venues, including the ASCCA, the American Society of Anesthesiologists (ASA), the Society of Critical Care Medicine (SCCM), the Society of Neurosurgical Anesthesia and Critical Care (SNACC), and the Society for Neuroscience (SFN). Depending on the interest of the fellow, a second year of research is also available.

Current research projects that are conducted by critical care fellows at SUNY downstate include studies on complement factors in sepsis and the role of drotrecogin alfa in septic shock. Fellows are encouraged to introduce educational innovations to their critical care fellowship program. A project that is being pursued by our critical care fellows is to introduce and study the role of simulation in critical care training, particularly in situations that require multidisciplinary collaboration such as cardiac arrest, shock, trauma and obstetric emergencies.

The critical care anesthesiology program at SUNY Downstate is well structured to provide multidisciplinary training with the goal of producing physicians who excel in the clinical, research, and administrative aspects of critical care medicine.

### Contacts:

For further information about the program please contact the fellowship program director: Dr. Jean Charchaflieh (718) 270-3269 [jcharchaflieh@downstate.edu](mailto:jcharchaflieh@downstate.edu) or the program coordinator Ms. Irina Kapitov (718) 270-1510 [Irina.kapitov@downstate.edu](mailto:Irina.kapitov@downstate.edu) SUNY Downstate Medical Center Box 6, 450 Clarkson Avenue Brooklyn, New York 11203

## Literature Review I: Sodium Bicarbonate to Prevent Increases in Serum Creatinine After Cardiac Surgery: A Pilot Double-blind, Randomized, Controlled Trial



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Assistant Professor and  
Associate Residency Program Director  
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Haase M, Haase-Fielitz A, Bellomo R, Devarajan P, Story D, Matalanis G, Reade MC, Bagshaw SM, Seevanayagam N, Seevanayagam S, Doolan L, Buxton B, Dragun D. *Crit Care Med.* 2009; 37(1):39-47.

### Objectives:

The aim of the study was to assess whether urinary alkalization with a perioperative sodium bicarbonate solution could reduce postoperative renal dysfunction in patients undergoing cardiac surgery.

### Methods:

Adult patients with at least one major risk factor for postoperative renal dysfunction who were scheduled for elective or urgent cardiac surgery were enrolled to this pilot, single-center, prospective, double-blind, randomized, controlled trial from June to December 2006. Patients who were randomized to the treatment group received a bolus of sodium bicarbonate (0.5 mmol/kg, adjusted body weight) over

1 hour following induction of anesthesia and a continuous infusion of 0.15 mmol/kg/hr for the next 23 hours. Patients who were randomized to the control group received normal saline at the same volume and rate as the treatment group. Other aspects of surgical and medical therapy were standardized and did not change during the study period.

### Results:

One hundred patients were randomized to either the treatment or control groups. There were no statistical differences in preoperative baseline characteristics between the groups. Fewer patients in the treatment group developed acute renal dysfunction (n = 16 versus n = 26; odds ratio 0.43; 95 percent CI 0.19 – 0.98) (p = 0.043). Other secondary outcome measures, including absolute and relative increases in plasma creatinine, absolute and relative increases in plasma urea concentration and increases in urinary NGAL concentration, were improved in patients receiving sodium bicarbonate versus the control. There was no difference in need for renal replacement therapy and hospital mortality between the groups.

### Discussion:

Postoperative renal dysfunction is a significant problem following cardiac surgery, especially in high-risk patients, which includes the elderly (age >70 year); patients with pre-existing renal insufficiency, congestive heart failure or diabetes mellitus; and patients undergoing valvular surgery (or combination revascularization and valvular surgery).<sup>1</sup> The development of postoperative renal dysfunction has been shown to worsen in-hospital, 30-day and one-year mortality.<sup>2</sup>

In this manuscript, the authors, using a highly-protocolized and well-constructed study, concluded that sodium bicarbonate infusion appears to reduce the incidence of acute renal dysfunction following cardiac surgery compared to normal saline control. However, the authors

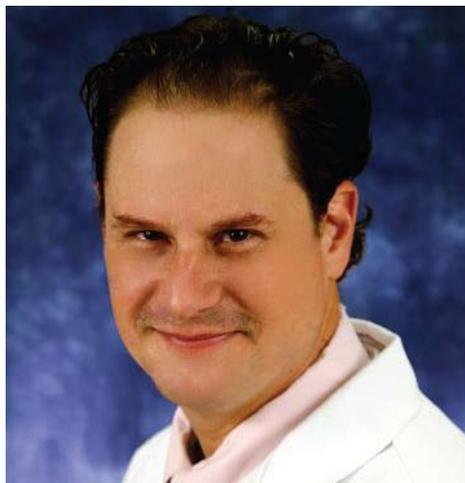
caution that these results should be confirmed by further clinical investigation, including a larger phase III study. Major limitations of this study include a small study population and only a marginally significant result for the primary outcome measure (p=0.043). In fact, if only one additional patient had developed renal dysfunction in the treatment group, then the statistical improvement would have been nullified. Additionally, related to this limitation, is the fact that the study was not powered to detect differences in mortality or need for renal replacement therapy.

In the face of these limitations, this data certainly justifies a larger phase III study of this therapy in cardiac surgery. Additionally, the application of this study protocol to cardiac surgery patients today should be done with caution, as it is not clear from this small patient mix whether the true benefit of this treatment (improvements in morbidity and mortality) are truly reduced compared to the risk of metabolic alkalosis as may arise from the institution of this treatment.

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## Literature Review II: Sequential Organ Failure Assessment Score for Predicting Outcome in Patients With Severe Sepsis



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Accuracy of Cardiac Function and Volume Status Estimates Using the Bedside Echocardiographic Assessment in Trauma /Critical Care

Mark Gunst, M.D., Vafa Ghaemmaghami, M.D., Jason Sperry, M.D., Melissa Robinson, M.D., Terence O'Keeffe, M.D., Randall Friese, M.D., and Heidi Frankel, M.D. *J Trauma*. 2008; 65:509-516.

In this study, the authors hypothesized that the Bedside Echocardiographic Assessment in Trauma (BEAT) examination would generate cardiac index (CI) and central venous pressure (CVP) estimates that correlate with that of pulmonary artery catheter (PAC). Data were collected prospectively from a cohort of 20 trauma surgical patients admitted to the intensive care unit. Eighty-five BEAT examinations were performed with a PAC in place. BEAT was performed in blinded fashion to all PAC data by one of six investigators. An offsite cardiologist blinded to the examinations analyzed the quality of all images obtained by investigators. Fifty-nine percent of the CI examinations and 97 percent of the IVC examinations contained quality im-

ages. Prospective data included stroke volume and the inferior vena cava (IVC) diameter.

The BEAT CI was calculated and correlated with the continuous CI from the PAC monitor. The overall Pearson correlation coefficient was 0.70 ( $P < 0.0001$ ). Each CI was also classified as "low," "normal" or "high" based on a normal value of 2.4 L/min/m<sup>2</sup> to 4.0 L/min/m<sup>2</sup>. The association between the BEAT and PAC categorized showed a significant result ( $p = 0.031$ ).

This study demonstrated a significant linear correlation between the CI and CVP estimates obtained from the BEAT examination and that from a PAC. This correlation is not novel and has been documented in a number of other studies.<sup>1,2</sup> Average time for the examination was 20 min, primarily for calculations and not acquisition of images. With experience, examination time should be much less.

The conclusions were that the BEAT examination provides a noninvasive method of evaluating cardiac function and volume status. Bedside echocardiography is teachable and should be part of the critical care curricula.

### Discussion:

Use of Echocardiography and particularly TEE (transesophageal echocardiography) has been well established as a diagnostic tool and for monitoring patients in perioperative (intra-operative and post-operative) cardiac surgery patients.

Bedside use of ECHO by ICU physicians remains limited due to cost, need for training and availability of alternative monitors, invasive and non invasive.<sup>3,4</sup>

Bedside echocardiography is not a continuous hemodynamic monitor, which limits its use in the ICU setting. However, the diagnostic information obtained by echocardiography provides better understanding of cardiac function than with any other bedside methodology.<sup>5</sup>

The value of this study is in the non-invasive nature of echocardiography as a powerful diagnostic and monitoring tool. This abbrevi-

ated standardized exam designed for trauma surgical patients advances further interest for the use of echocardiography in the ICU.

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## Independent Lung Ventilation in Unilateral Pneumonia: Case Report and Literature Review



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**Case presentation:** A 66-year-old obese male with no prior history of lung disease presents to an outside hospital with a 3-week history of cough and progressive dyspnea. Pertinent vital signs include oxygen saturation of 79 percent on room air, tachypnea in the 20s and temperature to 103.8° F. Chest X-ray reveals right upper and middle lobe infiltrates consistent with pneumonia. The patient is intubated and started on Levaquin and Zosyn. The next morning, his fever spikes to 104.2° F and he is now hypotensive. Vancomycin is added to his regimen and he is transferred to Dartmouth-Hitchcock Medical Center for further management.



“White-out” of the right lung by day #2

**Hospital Day #2:** The patient is profoundly septic, requiring fluid resuscitation and two pressors. Chest X-ray shows “white-out” of the right lung with relative sparing of the left lung. Bronchoscopy reveals thick blood-tinged secretions predominantly on the right. Stat Legionella urinary antigen is positive (later BAL cultures would also confirm Legionella); therefore, he is started on Moxifloxacin. Ventilation proves to be difficult with frequent desaturations in spite of 100-percent FiO<sub>2</sub>. Left side down positioning and administration of muscle relaxant yield only transient improvements. Different ventilator modes are attempted without success. Increasing PEEP beyond 5 mm Hg causes *drops* in arterial oxygenation. Serial ABGs demonstrate overall worsening picture with pCO<sub>2</sub> slowly increasing: By early evening of the 2<sup>nd</sup> day, his ABG is 7.19/51/71/92 percent on PRVC with a RR of 22, Vt of 500 and FiO<sub>2</sub> of 100 percent.

There is disagreement among the primary team and the consulting services whether to proceed with placement of a double lumen tube and independent ventilation of each lung. Is it indicated? What does the literature say?

**Literature Review:** Severe unilateral lung processes leading to independent lung ventilation are rare enough that there are no controlled studies, only case reports, case series and reviews. To complicate matters, many of the case series and reviews report on a mix of unilateral processes – from massive hemoptysis, aspiration, refractory atelectasis, and pulmonary contusions to pneumonias.<sup>1</sup> While all of these processes decrease lung compliance in the affected lung, they do so via different underlying mechanisms and therefore respond differently to interventions and have widely varying prognosis. For example, pulmonary contusions respond well to “good lung down” positioning often with significant resolution within 24 to 48 hours. Severe unilateral pneumonias, on the other hand, have

the worse prognosis with mortality in the 50 percent range.<sup>2</sup> Placement of double lumen tubes in massive hemoptysis is done more to protect the good lung from blood with the definitive intervention being control of bleeding via embolization or surgery. On the other hand, initiation of independent lung ventilation in refractory atelectasis is done primarily to protect the good lung from barotrauma secondary to aggressive lung recruitment maneuvers.

In severe unilateral pneumonias, there is greatly decreased compliance in the affected lung with near normal compliance of the unaffected lung. This leads to maldistribution of tidal volume away from the involved lung: In mechanical ventilation where there are conditions of equal pressure and flow to both lungs, the more compliant lung will receive a much greater portion of the tidal volume.<sup>1</sup> The resulting large ventilation-perfusion mismatch leads to a significant intrapulmonary shunt and resulting oxygenation deficit.<sup>3</sup> Hypoxic pulmonary vasoconstriction will compensate somewhat for the decreased ventilation. It has been hypothesized that failure of hypoxic vasoconstriction to adequately reduce the ventilation-perfusion mismatch may be a major factor determining which patients will require unconventional ventilation approaches.<sup>1</sup> Severe abnormalities of ventilation-perfusion matching are typically refractory to high FiO<sub>2</sub>.<sup>4</sup>

The application of PEEP may hyperinflate the more compliant lung leading to barotrauma. Furthermore, this hyperinflation of the good lung may exacerbate the ventilation-perfusion mismatch by shunting blood away from the normal lung leading to PEEP-induced worsening of hypoxemia.<sup>5</sup> The rate at which any of the above abnormalities occur in unilateral pneumonias is impossible to determine from the literature.<sup>1</sup>

There is a subset of patients with severe unilateral lung disease that do not respond

*Continued on page 16*

to conventional ventilation strategies. Most published criteria for independent lung ventilation are a compilation of the most frequently cited issues that prompted ICU physicians to attempt independent lung ventilation. The criteria as laid out below appeared in 1994 in a review by D. Tuxen and has been reproduced in many subsequent publications on independent lung ventilation:

**Proposed Criteria for the Initiation of Independent Lung Ventilation**

Radiographic evidence of unilateral lung disease with at least one of the following.

1. Hypoxemia refractory to high FiO<sub>2</sub> and generalized PEEP
2. PEEP-induced deterioration in oxygenation
3. Over-inflation of the noninvolved lung, +/- collapse of the affected lung
4. Significant deterioration in circulatory status in response to PEEP
5. PaO<sub>2</sub>/FiO<sub>2</sub> < 150

While the lack of controlled studies mean that they are not evidence-based, the above criteria appear reasonable.

Once the decision is made to proceed with independent lung ventilation, various approaches to separate the lungs have been used including: 1) Endobronchial blocker paired with an ET tube (common approach in the pediatric literature); 2) Double lumen tube (most common approach in the adult literature); and 3) Two small ET tubes. The ventilation strategies have ranged from 1) One lung ventilation with CPAP applied to the involved lung; 2) Ventilation of both lungs with application of differential PEEP; to 3) All manner of other combinations such as high-frequency ventilation to the affected lung, etc.. Overwhelmingly most independent lung ventilations are initiated to apply differential PEEP.<sup>1</sup> The amount of PEEP to apply is usually arbitrarily chosen, most ranging between 8 to 20 cm H<sub>2</sub>O, with the clinical picture and ABGs used to guide adjustments. A case series reported in 2004 used CT scans to guide the choice of PEEP: The starting PEEP was 2 cm H<sub>2</sub>O above that which permitted collapse with a reported range of 12 to 18 cm H<sub>2</sub>O.<sup>6</sup> Most independent

Hospital Day	Time	Mode	RR	Vt	PEEP	FiO <sub>2</sub>	ABG
Day #3	8 am	PRVC	22	500	5	100%	7.19 / 51 / 71 / 93%
Day #3	10 pm	VC left lung PC right lung	22 6	450	10 12	90% 90%	7.35 / 44 / 129 / 99%

ventilation approaches require two ventilators with either synchronous or asynchronous ventilation being equally tolerated and effective.<sup>7,8</sup>

**Back to our patient**, who in addition to radiographic evidence of a severe unilateral pneumonia also meets three of the above listed additional criteria: Refractory hypoxemia, PEEP-induced deterioration in oxygenation and a PaO<sub>2</sub>/FiO<sub>2</sub> of 71. The decision was made to proceed with placement of a double lumen tube and independent lung ventilation with volume control for the good lung and pressure control for the affected lung with PEEP of 12 mmHg. Ten hours later, the FiO<sub>2</sub> which had not been less than 100 percent since admission had been weaned to 90 percent and by the next morning was down to 75 percent.



Bilateral lung involvement by day #4

Unfortunately, due to positioning changes initiated by nursing, the double lumen tube slipped down out of position three times overnight, setting off ventilator alarms, requiring fiber optic adjustment and causing consternation among the respiratory therapists and nurses who had not had much exposure to double lumen tubes or independent lung ventilation. When the alarms went off again early on day #4, a trial

of equal ventilation with an ARDS protocol was initiated with no resulting drop in oxygenation, as had occurred on day #2. A chest X-ray taken several hours later revealed the explanation: The pneumonia now involved both lungs, making independent lung ventilation no longer necessary. The double lumen tube was removed and replaced with a regular endotracheal tube. The patient remained on an ARDS protocol for three weeks with eventual resolution of his pneumonia and was discharged from the ICU on day #30. One of the considerations prior to placing a double lumen tube is the availability of trained personnel to adequately manage both the tube and independent ventilation. Other considerations with double lumen tubes are that a regular bronchoscope cannot be used, and suction is limited where management of secretions may be as crucial as the ventilation approach.<sup>1</sup> For in-depth information, we recommend Thomas and Bryce's excellent review on independent lung ventilation (see references).

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## Perioperative Management of a Patient of Supra-Valvular Aortic Stenosis

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### Introduction:

Supravalvular aortic stenosis (SVAS) comprises about 5 percent of cases of aortic stenosis. It is usually a familial disorder with an autosomal dominant mode of inheritance. It can occur as a single gene disorder or as part of Williams Syndrome. Both forms are associated with stenosis of the coronary and peripheral pulmonary vessels, while the latter is also associated with mental retardation, abnormal facies and hypercalcemia.<sup>1</sup>

### Case report:

A 43-year-old man with a past medical history of benign prostatic hypertrophy presented to the emergency department with sharp left-sided chest pain radiating to the left arm. The pain occurred at rest, lasted for about two minutes, was accompanied with diaphoresis and palpitations and resolved spontaneously. A chest CT angiography was done, which ruled out aortic dissection or coarctation. Transthoracic echocardiography (TTE) showed a slightly thickened aortic valve with a pressure gradient of about 70 mmHg and mild concentric left ventricular hypertrophy (LVH) with an ejection fraction (EF) of 80 percent. Cardiac catheterization confirmed the presence of SVAS with a gradient pressure of 70 mmHg and normal coronary arteries [Figure 1]. Transesophageal Echocardiography (TEE) revealed tubular area of aortic narrowing (0.7 cm in diameter) about 2 cm above the valve leaflets with no regional wall motion abnormalities.

Based on this finding, the patient was scheduled for repair of the SVAS. Anesthetic preoperative assessment showed normal fa-

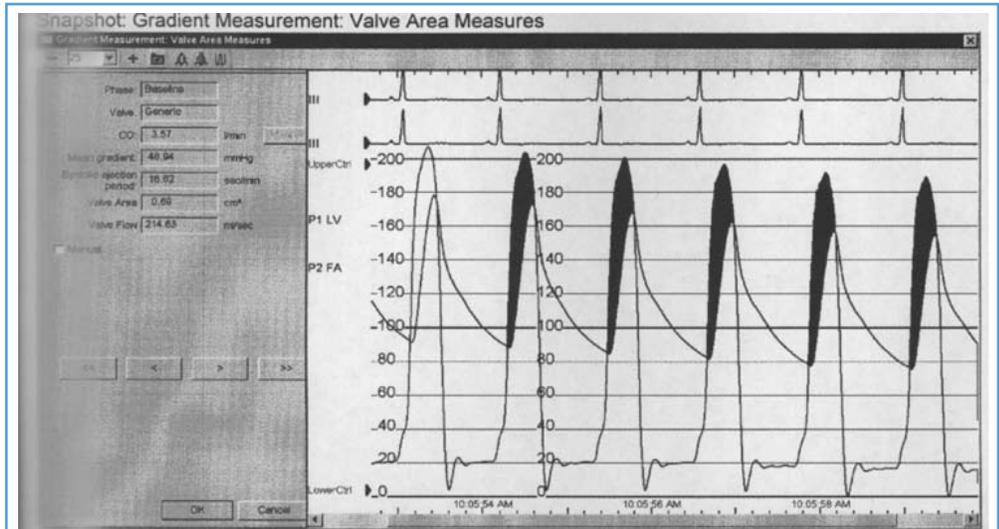


Figure 1. Aortic gradient as demonstrated by cardiac catheterization.

cies, a Mallampati score of 1, a thyro-mental distance of >6.5 cm, and normal mouth opening and normal neck extension. The rest of the physical examination was unremarkable. Electrocardiography (EKG) showed left ventricular hypertrophy. Laboratory findings were normal. Informed consent for general anesthesia and invasive monitoring of both blood pressure and pulmonary artery pressure were obtained from the patient. In the pre-anesthetic holding area, a 20-gauge left radial arterial catheter was inserted under local anesthesia.

In the operating room, standard ASA monitoring was applied then E-amino-caproic acid (150mg/kg i.v. bolus) was administered over 10 min. Pre-oxygenation was performed followed by induction of general anesthesia using intravenous midazolam 4 mg, fentanyl 500 mcg, etomidate 20 mg, and rocuronium 50 mg. Direct laryngoscopy and endotracheal intubation were performed atraumatically and without difficulty using 8.0 mm (ID) cuffed endotracheal tube. Pulmonary artery catheterization was performed using 7.5 French catheter inserted via a left subclavian vein introducer. Pre-surgical hemodynamic measurements revealed a cardiac index (CI) of 3.2 l/min/m<sup>2</sup>. Intra-operative TEE

revealed a 1.5 cm stenotic segment in ascending aorta with a pressure gradient of 80 mmHg [Figures 2 and 3]. General anesthesia was maintained using isoflurane inhalation (0.5-1.5 percent) and remifentanyl infusion (0.1 mcg/kg/min I.V.) plus intermittent intravenous doses of midazolam, fentanyl and rocuronium. Intravenous infusion of E-amino-caproic acid was continued at a rate of 1.5 mg/kg/hour throughout the case.

Surgical approach consisted of median sternotomy followed by veno-caval-aortic



Figure 2. Intra-operative TEE showing narrowed supra-valvular aortic segment.



**Figure 3.** Intraoperative TEE showing turbulent flow across SVAS.

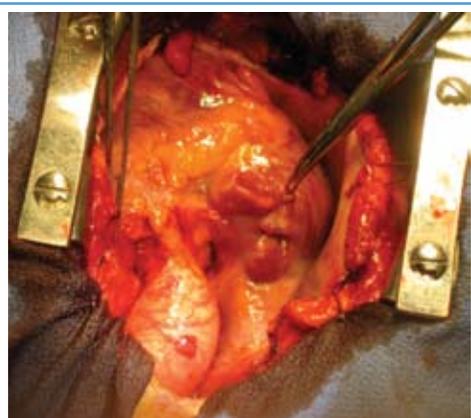
cannulation, initiation of cardiopulmonary bypass and cross clamping of the aorta distal to the stenotic segment. Surgical repair of the stenotic aortic segment was done using bovine pericardial patch [Figure 4]. Total duration of aortic cross-clamp time was 37 minutes. Weaning from cardiopulmonary bypass was facilitated using nor-epinephrine infusion for inotropic and vasopressor support. Post-surgical repair, TEE examination confirmed successful repair of the SVAS. Hemodynamic measurements yielded a CI of 4 l/min/m<sup>2</sup>. At the conclusion of surgery, the patient was kept intubated and sedated and was transported to the cardio-thoracic intensive care unit (CTICU). The patient was extubated on postoperative day number 1 and had an uneventful postoperative course.

### Discussion:

SVAS is a rare condition that takes the form of hour-glass constriction or diffuse narrowing of the ascending aorta. About 50 percent of cases of SVAS are associated with Williams syndrome, which is due to deletion of the elastin gene on chromosome 7. The syndrome consists of characteristic “elfin” facies, dental abnormalities, hypercalcemia, nephrolithiasis, musculoskeletal problems, hyperacusis with near perfect musical pitch, overly friendly personality, developmental delay, learning disability and attention deficit.

Few issues affect the anesthetic management of patients with Williams syndrome. An underdeveloped mandible and brittle teeth might complicate direct laryngoscopy and endotracheal intubation. Joint contractures might necessitate proper padding and positioning. Coronary artery stenosis increases the risk of myocardial ischemia. There have been numerous cases of cardiac deaths during cardiac and non-cardiac procedures often related to coronary insufficiency.<sup>2,3</sup> There have been a few case reports that have linked the occurrence of malignant hyperthermia to Williams syndrome.<sup>4</sup>

Physical examination might reveal cardiac murmurs as well as abdominal bruits. EKG might show signs of left ventricular hypertrophy, ischemia or a strain pattern. Echocardiography and cardiac catheterization would provide more definitive information regarding pressure gradient, aortic arch integrity, aortic valve anatomy, coronary circulation, ventricular function, and wall motion abnormalities. Principles of anesthetic management for SVAS are similar to those for aortic stenosis, which include maintenance of sinus rhythm, preload and contractility, avoidance of extremes of heart rate, and immediate correction of atrial fibrillation with electrical cardioversion.



**Figure 4.** Narrowed segment of the aorta at the center of the photo.

### Conclusion:

As with this presented case, SVAS is usually diagnosed as an incidental finding that requires urgent surgical repair. Anesthetic management should focus on the possibility of difficult airway management, balancing myocardial oxygen demand and delivery, and following principles similar to management of aortic stenosis. In view of the high risk of intraoperative mortality, similar principles should be followed when these patients undergo non-cardiac procedures.

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## A Great Year Behind Us, a Great Year Ahead

*Continued from page 1*

welcoming the new members to the board: **Avery Tung, M.D.**, and **Steve Deem, M.D.**, and to **Aryeh Shander, M.D.**, who was elected to the Executive Board as the new secretary.

A number of important positive things have occurred during this past year. Our membership has continued to grow and now is at its highest ever at 629. The changes and improvements made to the *Interchange* have been very well received. This project has been led by **Michael Wall, M.D.**, who has one additional year in his term. Our affiliation with *Anesthesia & Analgesia* has been very exciting. The number of critical care articles submitted and published have both increased. As part of our agreement

with the journal, we will play a key role in selecting the next section editor. The “Residents’ Guide Book” was completed and released and has been accepted well by the anesthesiology community. The next editorial team has already been established under the extremely able leadership of **Sheriff Afifi, M.D.**

Our relationship with the Foundation for Anesthesia Education and Research (FAER) continues to serve both organizations very well. This past year, we awarded two research grants through this program to **Michael L. James, M.D.**, from Duke and **Jennifer K. Lee, M.D.**, from Johns Hopkins. Plan now to submit to FAER for the ASCCA-FAER-Hospira grant. This two-year grant provides \$75,000 per year, and the next due date is February 15, 2010.

By the time you read this, we should have completed the work in creating a joint membership with IARS that will permit a single membership application and renewal process leading to membership in both organizations and the journal all at a reduced price.

I will conclude by reminding you that we are a Society of volunteers, and your help is always needed and appreciated. The success we are experiencing is because of our ability to function as a community. If you are interested in serving, please contact the new president-elect,

**Michael O’Connor, M.D.**, or me directly. Our contact information is available on the Society Web site [www.ascca.org](http://www.ascca.org).

## CON: Federal Government Involvement in End-of-Life Care Will Reduce Quality and Cost-Effectiveness

*Continued from page 6*

So the millennia-old role of physician as confidant, counselor, healer and patient-advocate will effectively be nullified by this legislation if it becomes law. Physicians will instead become the means of enforcing the decisions of the health administration. Many physicians, of course, are willing to do this. Though the bill’s sponsors and the current administration are utterly opposed to the principles and culture of the profession, several organizations, including the American Medical Association<sup>4</sup> and the Massachusetts Medical Society<sup>5</sup> (publisher of the *New England Journal of Medicine*) support this legislation and also the President’s agenda to nationalize and control health care in America.

“End-of-life care” would cease to exist under H.R. 3200. Instead, there would be merely physician compliance with government health

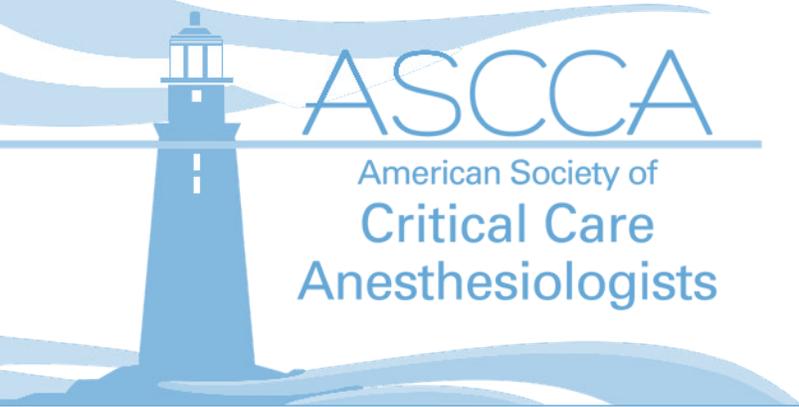
administrators’ one-size-fits-all, end-of-life decisions, reducing every critical care physician to a bureaucrat. Page 429 stipulates that only certain doctors or authorized caretakers can write an “order regarding life-sustaining treatment” only after an “advance care planning consultation,” (the new term for bureaucratized end-of-life discussion).

Even in the most benign incarnation, the legislation will take the form of onerous guidelines for rationing critical care and end-of-life care. Physicians would be rather more like law enforcement officers than bureaucrats. Opposition of the health administration would be met with sanctions, penalties, loss of license, or whatever else the Health Choices Commissioner decides. Such is the grim choice that awaits us if this odious legislation passes: Obey or don’t be a physician any longer. Obey or be reported to the National Health Quality

Database. Or worse, obey or lose your license, be fined and go to prison.

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